DRAFT
Nebraska Telecommunications Network (NETCOM)
Concepts And Assumptions
(Date of Last Revision: January 17, 2003)

In September 2002, the Nebraska Information Technology Commission (NITC) adopted the recommendations of the Nebraska Network Workgroup (http://www.nitc.state.ne.us/). Among other recommendations was the call for statewide purchasing and bandwidth aggregation of telecommunications services. NETCOM (Nebraska Telecommunications Network) is the telecommunications transport layer that will serve shared network services, as well as stand-alone network applications. NETCOM will eventually consist of a core network, edge networks, local connections to aggregation points, and a network operations center. NETCOM will utilize a phased-in approach leading to the deployment of a statewide network.

The goal of NETCOM is to improve service and lower the cost of meeting the telecommunications needs of Nebraska's state agencies, institutions of higher education, local governments, K-12 schools, healthcare facilities, and libraries. Objectives include consolidating bandwidth, supporting routing configurations and IP technology, providing effective network management and improving performance.

This document provides a high-level description of NETCOM, including concepts and assumptions.

A variety of factors will impact the order and timing of the actual deployment of different segments of the statewide network. These variables include the terms of existing contracts, bandwidth needs, participants, available opportunities, and other considerations. Initially the focus will be on data and Internet traffic. Video service will be more difficult to convert and will be deferred due to the technical, contractual, and bandwidth requirements of synchronous video networks. Full development may take several years.

When fully deployed, NETCOM will consist of a three-tiered environment. Tier 1 is the Core. It will be a very large capacity switched network that relies on universal standards and is served by a fiber infrastructure. Access points along this backbone are called core sites. Requirements for the Core Network include high capacity, high reliability, redundancy, and fault tolerance. The Core Network would support a full range of service classes as well as interoperability of technologies. Tier 2 is the Edge Network. The function of the Edge Networks is to provide an additional level of aggregation of the physical lines in a general location onto a broadband facility linked to the "Edge" of the Core network. The concentrators should be located in the local service provider's central office and be offered as a "Service" to all potential customers. The concentration points are referred to as regional aggregation sites. A total "Service" offering positioned at the intersection of the traditional local loop and the broadband core switched services would present new opportunities for reduced costs and enhanced capabilities. Tier 3 consists of the individual circuits connecting the user's facility to the regional aggregation sites.

NETCOM deployment will begin by establishing a phased-in core network. Phase I has been identified as a high capacity, fiber-based terrestrial backbone from Omaha to Lincoln and Lincoln to Grand Island. Identification and deployment of Phase II is scheduled to happen mid-

1st quarter of 2003. The attachments indicate the potential core backbone locations and the tasks/milestones schedule for calendar year 2003.

The technology choices for NETCOM should support additional capabilities beyond the traditional current arrangements. In larger towns and cities it is possible to lease dark fiber, and there are fiber-based service offerings that offer local area network (LAN) speeds. Also, more local exchange carriers are offering DSL for Internet access. Fractional T1 could be an option from the user's location to the broadband core network. Connecting non-traditional telecommunications services, such as cable or wireless systems, to the core network should also be an option.

A network operations center (NOC) will be essential to the management of NETCOM, but currently does not exist. The NOC will be responsible for all network related management activities, including trouble reporting, problem resolution, performance and traffic analysis, quality assurance and others. The NOC would help define a portfolio of management services. Traditional tariffed service offerings have always specified a modest set of performance objectives and an equally modest reimbursement schedule for non-performance. As today's networks are becoming increasingly critical in importance, network managers must seek more fail-proof systems and more performance guarantees. The NOC will address the subject of guarantees in two ways: 1) Transport services with innate quality of service characteristics will be specified as a technological strategy, and 2) Requirements for service level agreements (SLAs) along with the management techniques for performance evaluation.

At the request of the Chair of the NITC, the Division of Communications, University of Nebraska, and Nebraska Educational Telecommunications established the Collaborative Aggregation Partnership (CAP) as an operational entity to deploy a scalable and affordable statewide Core Network. The Public Service Commission and the Nebraska Department of Education also participate. The initial focus of CAP is to develop the Core Network, which will serve as the basic transport backbone for shared networks. CAP may help analyze the bandwidth requirements of applications, but will not assume responsibility for their deployment. Individual members of CAP or other entities will provide applications such as Internet 1, Internet 2, or other data networks.

The CAP should take the lead in preparing a digital service catalog that will provide an open view of the networking possibilities and services available. From the catalog, users would be able to craft organizationally unique networks that take advantage of NETCOM transport offerings. The catalog would reflect pricing, installation intervals, and maintenance arrangements. This would include traditional services as well as new offerings such as fractional T1, inverse multiplexing, ATM, Frame Relay, or multi-link Frame Relay. The catalog would include existing services and more advanced techniques such as SDSL, TLS, and wireless.

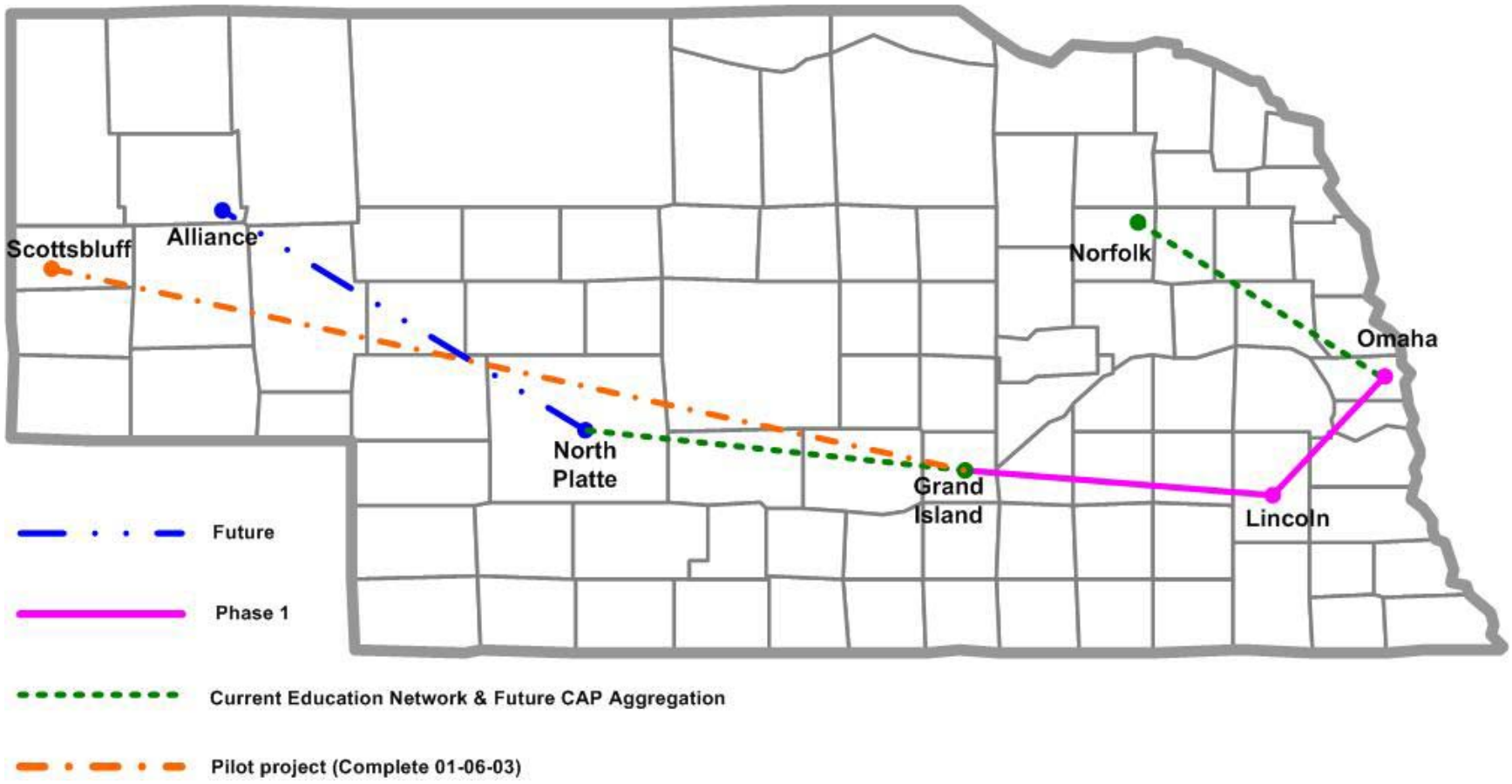
NETCOM is not an end in itself. Rather it is envisioned as a transport foundation upon which many higher levels of services, such as Internet access, video conferencing, telehealth, and other network applications, will be provisioned.

Coordination of Network Planning Activities

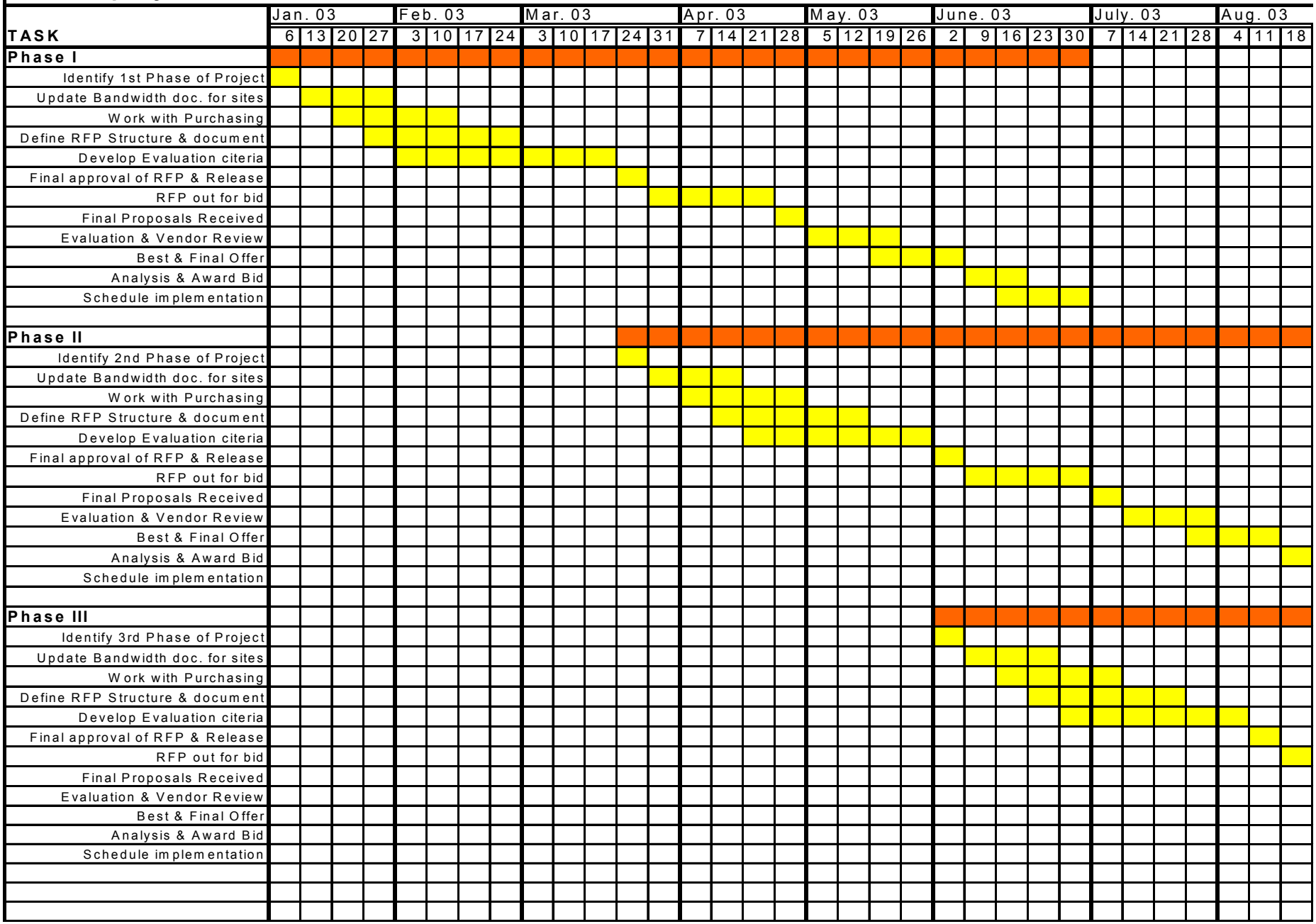
1. Collaborative Aggregation Partnership (CAP). CAP provides the operational structure for ordering broadband service and holding contracts. The responsibility of CAP is limited to designing and providing the transport layer for sharing networks. NETCOM will provide the backbone for delivering value-added services, but CAP will not develop or manage those services.

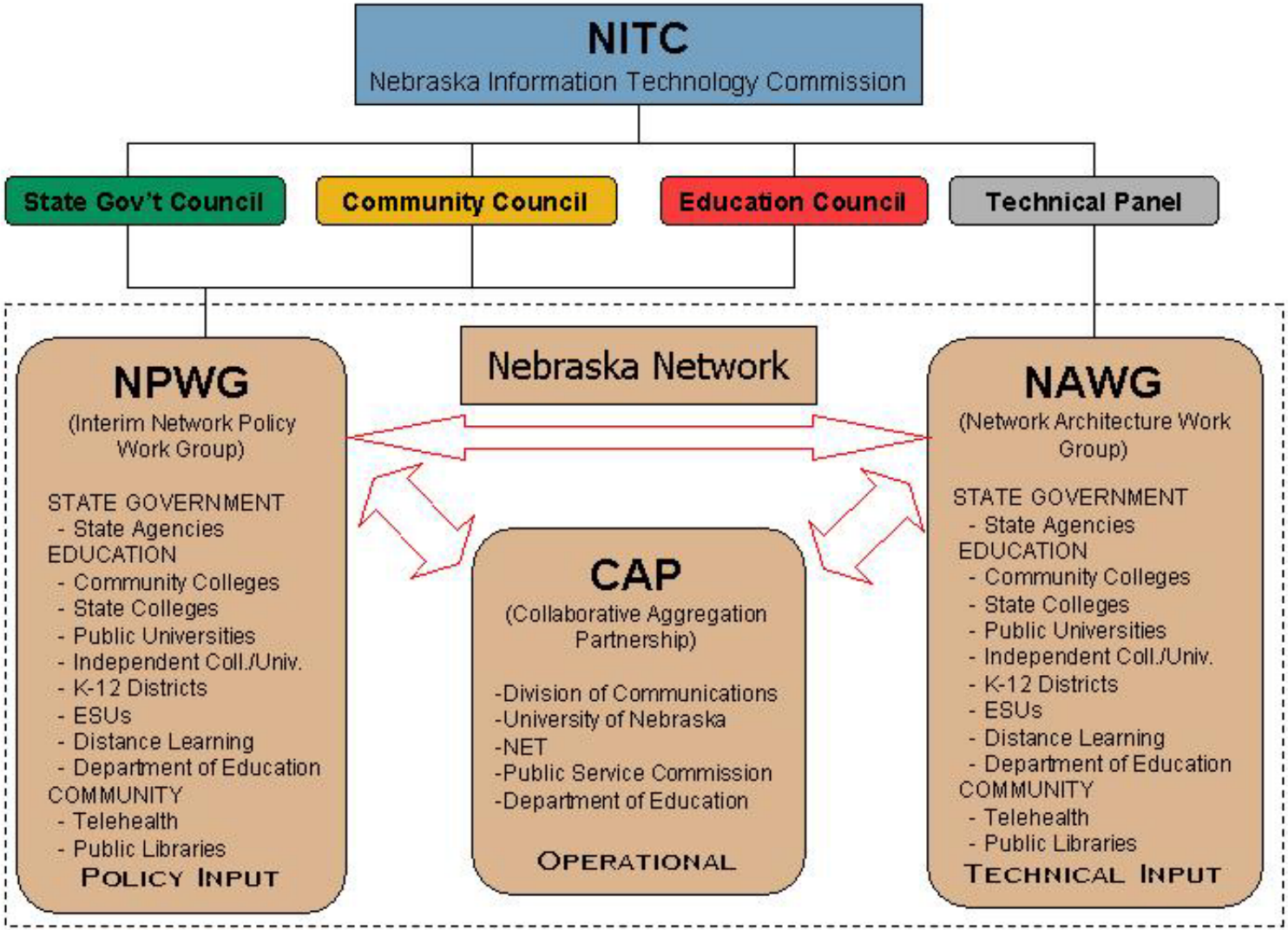
2. Network Architecture Work Group (NAWG). The Technical Panel created the NAWG to assist with developing the NETCOM RFP. A new assignment for NAWG is to provide advice and direction to the CAP as it builds the statewide backbone. NAWG will provide estimates of need, recommend technical requirements and constraints, and identify problems and issues related to the technical environment. NAWG is also the best group to work on other technical issues pertaining to future plans for regional and statewide networks.
3. Interim Network Policy Work Group (NPWG). Although not yet formed, this group would develop recommendations on long-term policy issues regarding the funding, operation and management of shared networks. The NPWG would also sponsor an annual meeting on NETCOM and other network plans and accomplishments.
4. Statewide Synchronous Video Network Work Group (SSVNWG). The Technical Panel established this work group in November 2002. Its purpose is to define the technical and non-technical requirements for interconnecting all synchronous video networks and meeting the scheduling needs of participants. The recommendations of this work group will eventually be incorporated into future planning for NETCOM.

Collaborative Aggregation Partnership (CAP)
"Desired" Core Sites



CAP Deployment Process - Tasks & Milestone Schedule




NITC
Nebraska Information Technology Commission
State Gov't Council
Community Council
Education Council
Technical Panel
Nebraska Network
NPWG
(Interim Network Policy Work Group)
STATE GOVERNMENT
- State Agencies
EDUCATION
- Community Colleges
- State Colleges
- Public Universities
- Independent Coll./Univ.
- K-12 Districts
- ESUs
- Distance Learning
- Department of Education
COMMUNITY
- Telehealth
- Public Libraries
POLICY INPUT
CAP
(Collaborative Aggregation Partnership)
-Division of Communications
-University of Nebraska
-NET
-Public Service Commission
-Department of Education
OPERATIONAL
NAWG
(Network Architecture Work Group)
STATE GOVERNMENT
- State Agencies
EDUCATION
- Community Colleges
- State Colleges
- Public Universities
- Independent Coll./Univ.
- K-12 Districts
- ESUs
- Distance Learning
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COMMUNITY
- Telehealth
- Public Libraries
TECHNICAL INPUT